

Claims

- 2 **1.** A method for preparing a stabilized aqueous alkali or alkaline earth metal  
hypobromite solution comprising:
- 4 a. Mixing an aqueous solution of alkali or alkaline earth metal hypochlorite  
having from about 5 percent to about 70 percent available halogen as chlorine with a  
6 water soluble bromide ion source;
- 8 b. Allowing the bromide ion source and the alkali or alkaline earth metal  
hypochlorite to react to form a 0.5 to 70 percent by weight aqueous solution of  
unstabilized alkali or alkaline earth metal hypobromite;
- 10 c. Adding to the unstabilized solution of alkali or alkaline earth metal  
hypobromite an aqueous solution of an alkali metal sulfamate in a quantity to provide a  
12 molar ratio of alkali metal sulfamate to alkali or alkaline earth metal hypobromite is from  
about 0.5 to about 7; and,
- 14 d. Recovering a stabilized aqueous alkali or alkaline earth metal hypobromite  
solution.
- 2.** The method according to Claim 1, wherein the alkali or alkaline earth metal  
2 hypochlorite is selected from the group consisting of sodium hypochlorite, potassium  
hypochlorite, lithium hypochlorite, magnesium hypochlorite, and calcium hypochlorite.
- 3.** The method according to Claim 1, wherein the bromide ion source is selected  
2 from the group consisting of sodium bromide, potassium bromide, lithium bromide, and  
hydrobromic acid.

09305892-050599

**4.** The method according to Claim 1, wherein the alkali or alkaline earth metal

2 hypochlorite is sodium hypochlorite, the bromide ion source is sodium bromide, and the  
alkali or alkaline earth metal hypobromite is sodium hypobromite.

**5.** The method according to Claim 1, wherein the aqueous solution of unstabilized

2 alkali or alkaline earth metal hypobromite contains from about 1 to about 30 percent by  
weight alkali or alkaline earth metal hypobromite.

**6.** The method according to Claim 1, wherein the aqueous solution of unstabilized

2 alkali or alkaline earth metal hypobromite contains from about 4 to about 15 percent by  
weight alkali or alkaline earth metal hypobromite.

**7.** The method according to Claim 4, wherein the aqueous solution of unstabilized

2 sodium hypobromite contains from about 1 to about 30 percent by weight sodium  
hypobromite.

**8.** The method according to Claim 4, wherein the aqueous solution of unstabilized

2 sodium hypobromite contains from about 4 to about 15 percent by weight sodium  
hypobromite.

**9.** The method according to Claim 7, wherein the pH of the stabilized aqueous

2 sodium hypobromite solution is from about 8 to about 14.

**10.** The method according to Claim 8, wherein the pH of the stabilized aqueous

2 sodium hypobromite solution is from about 11 to about 14

09305892.050559

11. The method according to Claim 9, wherein the molar ratio of the alkali metal  
2 sulfamate to the sodium hypobromite is from about 0.5 to about 4.

12. The method according to Claim 10, wherein the molar ratio of the alkali metal  
2 sulfamate to the sodium hypobromite is from about 0.5 to about 2.

13. A stabilized aqueous solution of an alkali or alkaline earth metal hypobromite  
2 which is prepared by the steps of:

a. Mixing an aqueous solution of alkali or alkaline earth metal hypochlorite  
4 having from about 5 percent to about 70 percent available halogen as chlorine with a  
water soluble bromide ion source;

b. Allowing the bromide ion source and the alkali or alkaline earth metal  
6 hypochlorite to react to form a 0.5 to 30 percent by weight aqueous solution of  
8 unstabilized alkali or alkaline earth metal hypobromite;

c. Adding to the unstabilized solution of alkali or alkaline earth metal  
10 hypobromite an aqueous solution of an alkali metal sulfamate in a quantity to provide a  
molar ratio of alkali metal sulfamate to alkali or alkaline earth metal hypobromite is from  
12 about 0.5 to about 7; and,

d. Recovering a stabilized aqueous alkali or alkaline earth metal hypobromite  
14 solution.

14. An industrial water system containing from about 0.05 to about 1000 ppm of the  
2 solution of Claim 13.

09305692-050599

Sub AL

15. In a method for the laundering of soiled garments in which the soiled garments are washed in an aqueous media containing a detergent and a bleaching agent, the improvement comprises using as the bleaching agent the solution of Claim 13.

16. In a method for the manufacture of cellulosic materials in which cellulosic fibers are bleached with an oxidizing agent, the improvement comprises using as the oxidizing agent the solution of Claim 13.

17. In a method for the control of microbiofouling in a recreational water system in which an oxidizing agent is added to control microbiofouling, the improvement comprises using as the oxidizing agent the solution of Claim 13.

18. In a method for the control of microbiofouling occurring on the surfaces of equipment in contact with produced oil field waters, the improvement comprises adding to the produced oil field waters an anti-microbiofouling effective amount of the solution of Claim 13.

19. A method of controlling microbiofouling in an aqueous system which comprises adding to the aqueous system an effective, anti-microbiofouling amount of the solution of Claim 13.

20. A method of preventing microbiofouling on the surfaces of equipment in contact with in an industrial water system which comprises adding to the aqueous system an anti-

09305892-050599

microbiologically effective amount of a stabilized sodium hypobromite solution, said  
 4 solution having been prepared by the steps of:

- a. Mixing an aqueous solution of alkali or alkaline earth metal hypochlorite  
 6 having from about 5 percent to about 70 percent available halogen as chlorine with a  
 water soluble bromide ion source;
- b. Allowing the bromide ion source and the alkali or alkaline earth metal  
 hypochlorite to react to form a 0.5 to 30 percent by weight aqueous solution of  
 10 unstabilized alkali or alkaline earth metal hypobromite;
- c. Adding to the unstabilized solution of alkali or alkaline earth metal  
 12 hypobromite an aqueous solution of an alkali metal sulfamate in a quantity to provide a  
 molar ratio of sulfamate to hypobromite of from about 0.5 to about 7; and,
- d. Recovering a stabilized aqueous alkali or alkaline earth metal hypobromite  
 14 solution.

**21.** The method according to Claim 20, wherein the industrial water system is

- 2 selected from a group consisting of: a cooling water system; a sweetwater system; a gas  
 scrubber system; and, an air washer system.

**22.** The method of Claim 20, wherein the aqueous solution of an alkali metal

- 2 sulfamate is replaced with a stabilizer selected from the group consisting of carbonic  
 acids, hydrogen cyanide, carboxylic acids, amino acids, sulfuric acids, phosphoric acids  
 4 and boric acids.

09305892.050599

32

*Sub H2*  
**23.** The method of Claim 22, wherein the stabilizer is selected from the group

2 consisting of urea, thiourea, creatinine, cyanuric acids, alkyl hydantoins, mono or di  
ethanolamine, organic sulfonamides, biuret, sulfamic acid, organic sulfamates and  
4 melamine.

**24.** The method of Claim 13, wherein the aqueous solution of an alkali metal

2 sulfamate is replaced with a stabilizer selected from the group consisting of carbonic  
acids, hydrogen cyanide, carboxylic acids, amino acids, sulfuric acids, phosphoric acids  
4 and boric acids.

**25.** The method of Claim 24, wherein the stabilizer is selected from the group

2 consisting of urea, thiourea, creatinine, cyanuric acids, alkyl hydantoins, mono or di  
ethanolamine, organic sulfonamides, biuret, sulfamic acid, organic sulfamates and  
4 melamine.

**26.** The method of Claim 1, wherein the aqueous solution of an alkali metal sulfamate

2 is replaced with a stabilizer selected from the group consisting of carbonic acids,  
hydrogen cyanide, carboxylic acids, amino acids, sulfuric acids, phosphoric acids and  
4 boric acids.

**27.** The method of Claim 26, wherein the stabilizer is selected from the group

2 consisting of urea, thiourea, creatinine, cyanuric acids, alkyl hydantoins, mono or di  
ethanolamine, organic sulfonamides, biuret, sulfamic acid, organic sulfamates and  
4 melamine.

05305502-050509  
665050-2695050